

# **Foundations of Advanced Mathematics (MEI)**

INTERMEDIATE FSMQ 6989

## **Combined Mark Scheme And Report on the Unit**

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**June 2007**

**6989/MS/R/07**

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# **Mark Scheme and Report on the Unit June 2007**

## **Foundations of Advanced Mathematics – 6989**

### **Report and Mark Scheme**

There were 933 entries for this session, easily the largest number in a session, which is most encouraging. The mean mark was 21.5, slightly up on last year. The minimum mark scored by three candidates was 6; no candidate scored full marks, though 2 scored 39. These statistics are in spite of the fact that there were rather more questions than usual that caught out candidates, and there were 7 questions in which the wrong answer was selected by more candidates than the right answer.

In many papers the correct answer has been given by between 80% and 90% of the candidature on a number of questions; on this paper this happened only twice (Q2 operations and Q32, Substitution). A number of other questions attracted over 70% of correct responses.

The greatest problem was caused by Q21 (proportions). Here the mass of a length of rope is proportional to its volume so if the radius is doubled the mass is multiplied by 4; 81% simply took the answer that was the ratio of radii.

Q26 (Vector diagram) was also unusual in that the correct answer was the least popular answer. Here, candidates tend to take the mirror image of the diagram given in order to get the plane to fly due east, instead of taking a triangle in which the speed of the plane is the hypotenuse.

In Q6 (approximate values in formula and rearrangement) nearly 50% of candidates thought that the correct rearrangement of the formula was incorrect while an incorrect approximation was thought to be correct by 38%.

In Q15 ( setting up equations involving speed and distance) the correct response giving the speed of a cycle ride as distance over time multiplied by 60 to convert the units was thought to be incorrect by 37% while only 29% took the same idea for the run but divided by 60 to convert the units as the correct response.

In Q20 (displacement/time graph) candidates clearly confused the graph with that of a speed/time graph, and so saw the response “the particle is stationary” at the point where the curve crossed the x-axis as a correct answer while the response to do with the gradient of the tangent was seen as incorrect.

In Q37 (Algebraic simplification) response A was the most popular choice of the correct answer. It is likely that by this time candidates are beginning to run out of time and made a predictable error without checking the other responses.

Likewise, in Q40 (Sine and cosine rules), response A was the most straightforward of applications to give a correct value for the third side of the triangle, but was chosen as incorrect. It may be that lack of time meant not considering the question carefully and trying to apply Pythagoras in some way which would obviously yield this answer as incorrect.

As in previous sessions I offer a summary of questions and topics with the approximate percentage of candidates giving the correct responses. As noted in previous reports, the giving of the correct response may not be because the candidate understands the question and can discern the errors being made in the distracting responses. Attempts are made not to offer distractors in such a way that the correct response is clearly different to the rest, but our perception of typical errors might result in that happening.

*Mark Scheme and Report on the Unit taken in June 2007*

	<b>Question</b>	<b>Topic</b>
81 – 90%	2	Operations
	32	Substitution
71 – 80%	3	Algebra - substitution
	11	Interpreting pictogram
	18	Sampling, average and range
	19	Simultaneous equations
	28	Conversion graph
61-70%	5	Standard form
	8	Equations
	9	Interpreting a compound bar chart
	13	Indices
	25	Graphs of linear functions
	30	Quadratic functions
	31	Setting up an equation
51 –60%	4	Algebraic simplification
	7	Percentages
	10	Conversion of units
	14	Estimation
	17	Arithmetic
	23	Percentage increase
	24	Cumulative frequency
	29	Inequalities
	33	Area under curve
	34	Interpreting equation
	35	3-D geometry
	39	Quadratic sequence
41 – 50%	1	Number
	12	Probability
	22	Pie chart
	27	Vectors
	36	Trigonometry
31 – 40%	6	Approximations and rearrangements
	38	Graphs of trigonometrical functions
	40	Sine and cosine rules
21 – 30%	15	Setting up equations
	16	3-D geometry
	20	Displacement-time graph
	37	Algebraic simplification
11 – 20%	26	Vector diagram
0 – 10%	21	Proportions

*Mark Scheme and Report on the Unit taken in June 2007*

Answers

1	A	21	C
2	B	22	B
3	D	23	A
4	B	24	D
5	A	25	A
6	B	26	D
7	D	27	C
8	D	28	D
9	D	29	B
10	A	30	B
11	C	31	A
12	B	32	D
13	C	33	B
14	C	34	D
15	C	35	C
16	C	36	B
17	A	37	C
18	C	38	A
19	A	39	C
20	B	40	D





**FSMQ Intermediate Foundations of Advanced Mathematics (FAM)  
June 2007 Assessment Session**

**Unit Threshold Marks**

<i>Unit</i>	<b>Maximum Mark</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>U</b>
<b>6989</b>	40	31	27	23	19	15	0

The cumulative percentage of candidates awarded each grade was as follows:

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>U</b>	<b>Total Number of Candidates</b>
<b>6989</b>	8.5	22.6	44.1	66.6	85.3	100	933



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